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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/030,441	05/16/2002	Hung Y. Fan	UC11150-1	6562

7590 02/24/2004

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EXAMINER	
CHEN, STACY BROWN	
ART UNIT	**PAPER NUMBER**
1648	

DATE MAILED: 02/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/030,441	FAN ET AL.	
	Examiner	Art Unit	
	Stacy B Chen	1648	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-59* is/are pending in the application.

4a) Of the above claim(s) *13-36 and 42-59* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 37-41* is/are rejected.

7)☒ Claim(s) *37* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's response filed November 24, 2003 is acknowledged. Claims 1-12 and 37-41 are pending and examined. Claims 13-36 and 42-59 are pending and withdrawn from further consideration as being drawn to a nonelected inventions. Applicant timely traversed the restriction (election) requirement in their response filed November 24, 2003. Applicant asserts that the claims of the invention are not distinct because they are linked by a special technical feature. In response, the asserted special technical feature is anticipated by the prior art. (See the Restriction Requirement dated August 26, 2003). The claims do not share a special technical feature because the special technical feature is anticipated, and therefore, the claims lack unity of invention. Further, Applicant argues that there would be no serious burden on the examiner to search all of the claims. In response, such a search would place a serious burden on the examiner. Further, the Office is not required to show a burden of search in national stage applications (MPEP 1893.03(d), unlike applications filed under 35 U.S.C. 111(a)). Therefore, the restriction is deemed proper and made FINAL.

Specification

2. The disclosure is objected to for the following reasons:

a) The disclosure lacks a sequence listing for sequences referred to in the specification but not properly notated on pages 12, 66 and 76. Basically, the sequence rules define a set of symbols and procedures that are both mandatory and the only way that an applicant is permitted to describe information about a sequence that falls within the definitions used in the rules. Thus, 37 CFR 1.821 defines a "sequence" and a "Sequence Listing" for the

purpose of the rules, the requirements for specific symbols, and formats for the "Sequence Listing," the requirement for a computer readable form (CRF) of the "Sequence Listing," and the deadlines for complying with the requirements. 37 CFR 1.822 to 37 CFR 1.824 set forth detailed descriptions of the requirements that are mandatory for the presentation of sequence data, and 37 CFR 1.825 sets forth procedures that are available to an applicant in the event that amendments to the sequence information or replacement of the computer readable copy become necessary. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

b) The disclosure contains an embedded hyperlink and/or other form of browser-executable code on page 27. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

c) The disclosure lacks proper notation to a Figure referred to on page 97.

d) The disclosure fails to indicate the extent of public availability regarding Applicant's deposit statement regarding Gen Bank Accession No. AF105220 on specification pages 6, 12, 24 and 66.

Claim Objections

3. Claim 37 is objected to because of the following informalities: "an subject" should be "a subject". Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 3 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant refers to a sequence set forth in a deposit in claim 3. Applicant's deposit statement regarding Gen Bank Accession No. AF105220 on specification pages 6, 12, 24 and 66 does not indicate the extent of public availability.

If the deposit is made under the terms of the Budapest Treaty, then an affidavit or declaration by applicants or someone associated with the patent owner who is in a position to make such assurances, or a statement by an attorney of record over his or her signature, stating that the deposit has been made under the terms of the Budapest Treaty and that all restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the granting of a patent, would satisfy the deposit requirements. See 37 CFR 1.808.

If a deposit is not made under the terms of the Budapest Treaty, then an affidavit or declaration by applicants or someone associated with the patent owner who is in a position to make such assurances, or a statement by an attorney of record over his or her signature, stating that the deposit has been made at an acceptable depository and that the following criteria have been met:

(a) during the pendency of this application, access to the invention will be afforded to one determined by the Commissioner to be entitled thereto;

(b) all restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed upon granting of the patent;

(c) the deposit will be maintained for a term of at least thirty (30) years and at least five (5) years after the most recent request for the furnishing of a sample of the deposited material;

(d) a viability statement in accordance with the provisions of 37 CFR 1.807; and

(e) the deposit will be replaced should it become necessary due to inviability, contamination or loss of capability to function in the manner described in the specification.

In addition the identifying information set forth in 37 CFR 1.809(d) should be added to the specification. See 37 CFR 1.803 - 37 CFR 1.809 for additional explanation of these requirements.

5. Claims 37-41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 36-41 are drawn to a pharmaceutical composition useful for inducing an immune response to a Jaagsiekte sheep retrovirus (JSRV) in a subject comprising an immunogenically effective amount of a JSRV or JSRV polypeptide in a pharmaceutically acceptable carrier. The specification fails to teach how to use a JSRV or JSRV polypeptide to induce an immune response having a pharmaceutical effect in a subject. The Office's position regarding the meaning of a pharmaceutical composition is that the composition must have some therapeutic benefit. Solely inducing an immune response is not a therapeutic benefit. Applicant has only described how to induce an immune response on page 4 of the specification. Applicant indicates that an agent that modulates HSRV expression can be used to treat pathologies associated with JSRV, such as lung cancer (page 37). Applicant also indicates that antibodies can be used to treat or ameliorate symptoms attributable to a JSRV-associated disorder (page 37). Applicant has not described how to use a JSRV or a JSRV polypeptide to achieve a therapeutic benefit. Therefore, claims 37-41 are rejected for failing to comply with the written description requirement.

6. Claims 37-41 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a composition that induces an immune response, does not reasonably provide enablement for a pharmaceutical composition having therapeutic benefit. The Office's position regarding the meaning of a pharmaceutical composition is that the composition must have some therapeutic benefit. Solely inducing an immune response is not a therapeutic benefit. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims. The breadth of the claims is unreasonable, encompassing a pharmaceutical composition that induces an immune response having a therapeutic benefit to the subject receiving the composition. The nature of the invention is the administration of a retrovirus or retroviral polypeptide to a subject in order to induce an immune response against the virus or polypeptide that will achieve a therapeutic benefit. The state of the art regarding Jaagsiekte sheep retrovirus (JSRV) is that there are no treatments or vaccines, according to the Institute for International Cooperation in Animal biologics, a World Organization for Animal Health Collaborating Center, http://www.vetmed.iastate.edu/services/institutes/cfsph/FactSheets/ovine_pulmonary_adenomatosis.pdf, last updated June 3, 2003. The level of one of ordinary skill in the art is high. The level of predictability in the art regarding the administration of antigen-based retroviral pharmaceutical compositions is low, evidenced by the failure of an AIDS vaccine comprising env/gag proteins (Barouch *et al.*, *Nature*, 2002, 415:335-339). The specification fails to provide guidance or working examples to show how to achieve a pharmaceutical benefit using a JSRV or JSRV polypeptide. Applicant has only taught how to induce an immune response on page 4 of

the specification. The quantity of experimentation needed to make or use the invention based on the content of the disclosure is undue. Given the breadth of the claims, the state of the art, the low level of predictability regarding antigen-based retroviral pharmaceutical compositions and the lack of guidance/working examples, the claims are not fully enabled for a pharmaceutical composition comprising a JSRV or JSRV polypeptide.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 3 is drawn to a retrovirus having a genomic sequence as set forth in GenBank accession no. AF105220. It is not clear what sequence is being referenced because the specification fails to disclose what sequence is contained in the deposit.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by York *et al* (*Journal of Virology*, September 1991, 65:5061-5067). The claims are drawn to an isolated replication competent infectious Jaagsiekte sheep retrovirus (JSRV) comprising the proteins gag,

env and pol. The retrovirus also comprises a genome comprising long-terminal repeat sequences at the 5' and 3' end of the retroviral genome, wherein the LTR is active in pulmonary epithelial cells, a polynucleotide sequence encoding gag, pol and env, and cis-acting nucleic acid sequences necessary for reverse transcription, packaging and integration in a target cell. The retrovirus has a genomic sequence set forth in GenBank accession no. AF105220.

York teaches the purification of a Jaagsiekte retrovirus containing the gag, env and pol proteins, LTRs and nucleic acid sequences encoding proteins for other function, see page 4930, second column, first and second full paragraphs. The activity of the LTR in pulmonary epithelial cells is an inherent property, demonstrated by Applicant's own work (Palmarini *et al.*, *J. Virology*, 2000, 74:5776-5787). The genome contents are inherently present in the Jaagsiekte retrovirus taught by York. Regarding the genomic sequence, it is unclear what sequence is being claimed in claim 3 referring to the deposit. Lacking evidence to the contrary, the genomic sequence of Applicant's deposit which contains gag, env and pol encoding sequence, is anticipated by York's JSRV which contains gag, env and pol sequences of JSRV. Therefore, claims 1-3 are anticipated by the prior art.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 37-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over York *et al* (*Journal of Virology*, September 1991, 65:5061-5067) as applied to claims 1-3 above, and further in view of Salk *et al* (6,017,543) and Gilbert *et al* (5,017,688). The claims are drawn to a pharmaceutical composition useful for inducing an immune response to JSRV comprising an immunogenically effective amount of a JSRV or JSRV polypeptide in a pharmaceutically acceptable carrier. The JSRV can be non-infectious and heat-inactivated. The JSRV polypeptide can be the envelope (env) polypeptide. The pharmaceutical composition can also contain an adjuvant. *In view of the rejections of claims 37-41 under 35 U.S.C. 112, first paragraph above, the claims are interpreted as immunogenic compositions only, having no therapeutic benefit.*

The teachings of York have been summarized. York fails to teach an immunogenic composition comprising JSRV.

However, Salk discloses retroviral immunogens to booster the immune response from a previous immunization. The retroviral immunogens are prepared from whole heat-inactivated virus (col. 7 lines 40-58 and col. 8, lines 11-12 and 51-53).

Gilbert discloses immunogenic compositions comprising peptides from the envelope (env) region of the HIV and adjuvants (abstract and col. 5, lines 45-50).

It would have been obvious to use JSRV as an immunogenic composition. One would have been motivated to use JSRV in an immunogenic composition because Salk uses retroviruses to elicit immune responses. Further, one would have been motivated to use the env protein of JSRV because Gilbert uses the env protein of HIV, known to be highly immunogenic, to elicit an immune response. Since JSRV is the disease-causing agent of lung cancer in sheep,

one would have been motivated to use the virus to elicit an immune response, just as Salk uses retroviruses to elicit immune responses. One would have had a reasonable expectation of success that JSRV would work as an immunogenic composition because of the well known art of immunization, evidenced by Salk. It would have been obvious to inactivate JSRV with heat because it is a well known and practiced method of viral inactivation prior to administration, evidenced by Salk. One would have had a reasonable expectation of success that heat-inactivation would have inactivated JSRV because heat inactivates other retroviruses, as well as viruses in general.

10. Claims 4-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasahara *et al* (6,410,313 B1) in view of York *et al* (*Journal of Virology*, September 1991, 65:5061-5067). The claims are drawn to a recombinant replication competent JSRV comprising gag, pol, env, a genome comprising LTR sequences and a heterologous polynucleotide, and cis-acting nucleic acid sequences necessary for reverse transcription, packaging and integration in a target cell. The env protein further comprises a target-specific ligand sequence and can be an antibody, receptor or ligand. The target cell is a pulmonary cell having a proliferative disorder such as lung cancer. The heterologous polynucleotide is a marker gene or a suicide gene, such as thymidine kinase.

Kasahara discloses a recombinant replication competent retrovirus comprising gag, pol, env, an oncoretroviral polynucleotide sequence comprising LTR sequences at the 5' and 3' end of the oncoviral genome, a heterologous nucleic acid sequence operably linked to a regulatory nucleic acid sequence and cis-acting nucleic acid sequences necessary for reverse transcription,

packaging and integration in a target cell (see Kasahara claims 1-16). The env protein further comprises a target-specific ligand sequence and can be an antibody, receptor or ligand. The target cell is a pulmonary cell having a proliferative disorder such as lung cancer. The heterologous polynucleotide is a marker gene or a suicide gene, such as thymidine kinase.

Kasahara is silent on JSRV. However, York discloses a JSRV having gag, pol, env, a genome with LTR sequence and cis-acting nucleic acid sequences.

It would have been obvious to use York's JSRV in Kasahara's recombinant retrovirus. One would have been motivated by Kasahara's use of oncoviruses, such as those disclosed in claim 2 of Kasahara, and also column 12, lines 7-44. Kasahara teaches that the retrovirus according to their invention is a replication competent retrovirus that does not require helper virus or additional nucleic acid sequence or proteins in order to propagate and produce virion (col. 12, lines 7-10). One would have had a reasonable expectation of success that the York's virus would have worked in Kasahara's retrovirus design because JSRV is an retrovirus/oncovirus and shares the same properties as taught by Kasahara's retrovirus.

Therefore, the invention as a whole would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Conclusion

11. No claim is allowed.

Papers relating to this application may be submitted to Group 1600 by facsimile transmission. Papers should be faxed to Group 1600 located in Crystal Mall 1. The Fax number for Art Unit 1648 is (703) 872-9306. All Group 1600 Fax machines will be available to receive transmissions 24 hrs/day, 7 days/wk. Please note that the faxing of such papers must conform with the Notice published in the Official Gazette, 1096 OG 30, (November 15, 1989).

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Stacy B. Chen, whose telephone number is (571) 272-0896. The Examiner can normally be reached on Monday through Friday from 7:30 AM-4:00 PM, (EST). If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's Supervisor, James C. Housel, can be reached at (571) 272-0902. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0196.

SBC
Stacy B. Chen
February 20, 2004

James C. Housel 2/23/04
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